

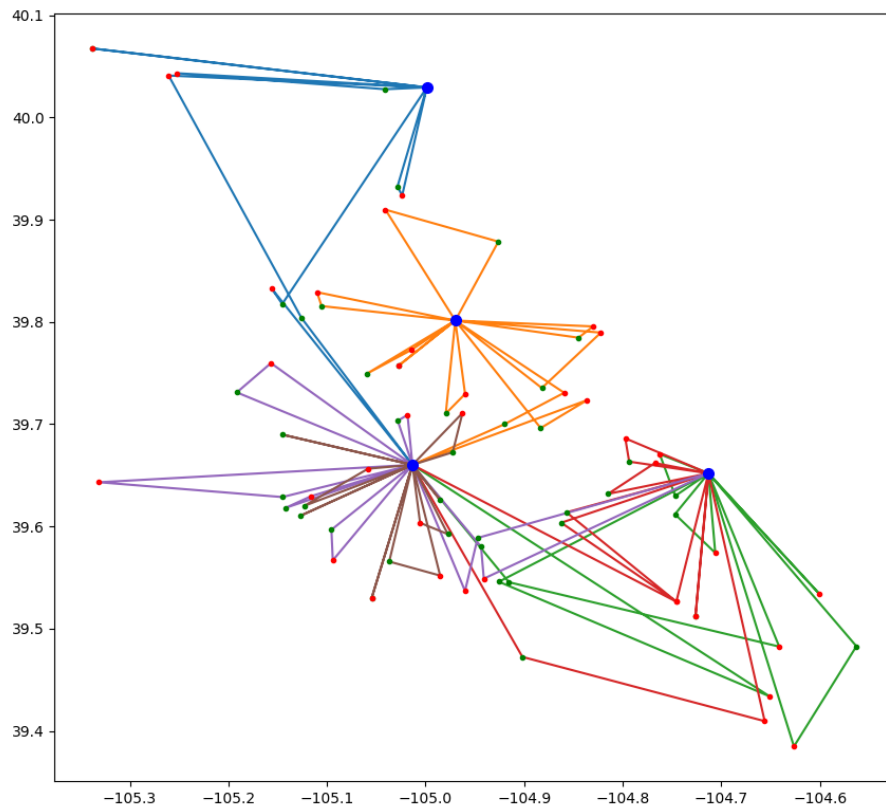
Math Clinic Status Update 4

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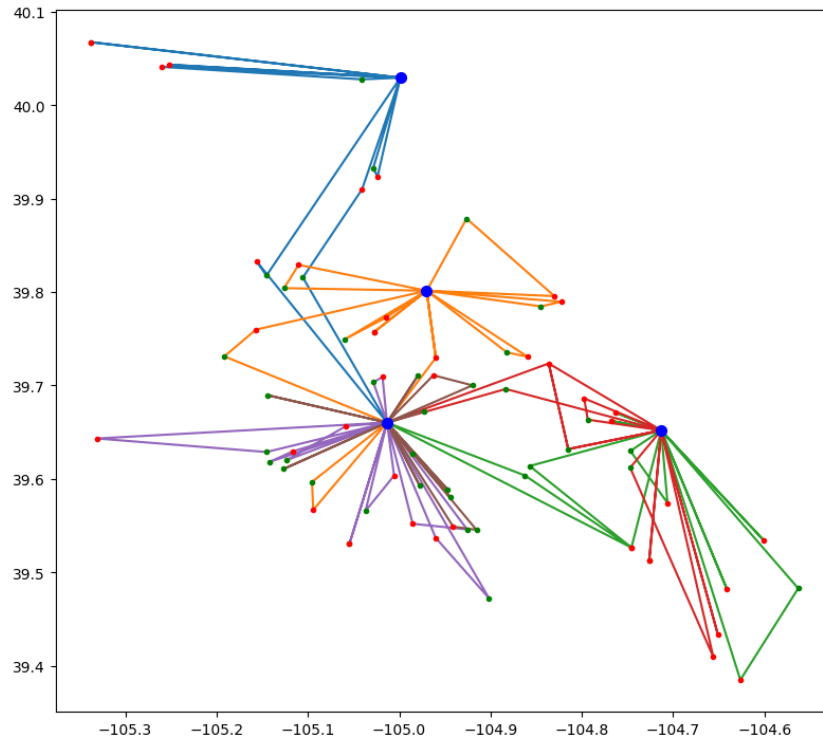
November 20th, 2019

1 Since our last update...

We have added visualizations to the route assignment algorithm, and made some optimizations. The routes look valid for the most part, though there are some strange things, such as some nodes appearing to have degree 3.



Route visualization, each worker doing only 300 minutes of driving, each color represents a drivers route.
No delivery-pickup zone restriction.



Same as above, but with delivery-pickup zone restriction.

The resulting cost of the two route configurations is in favor of unrestricted delivery-pickup pairs, and since it's already implemented, there's no reason to be concerned about the complications of the implementation. This is the system we will use.

Here is the basic outline of how route assignment works:

1. Receive data for the day and process it into the program.
2. Create pairs with Hungarian algorithm.
3. Assign driver to resolve truck size constraint.
4. Transition to the farthest zone that requires the truck resolving a hard can deficit if applicable.
5. Service all routes within the zone that require the truck and return to 2 if more applicable routes exist in other zones.
6. Finish route as per a normal driver and return to 1 if other truck size constraints exist.
7. Assign next driver to farthest zone with routes.
8. Transition to the zone.
9. If applicable resolve hard can deficits.
10. Assign remaining routes by prioritizing AM/PM constraints and then distance to the main hub.
11. If there are no more routes in the zone return to 6 choosing the next zone with routes remaining.

12. If the driver schedule is full including the transition back to the main hub transition back to the main hub and return to 6.
13. Iterate through the day to resolve any soft can deficits.
14. Output schedules.

2 What's on our plate now...

- Satisfy other constraints for driver routes
- Satisfy inventory constraints for landfills

3 What's next...

- Pull customer data (and constraints) directly from client files
- Add driver object, make route assignment more readable